

- C 1
12. (Amended) A method of provoking an immune response to glucosyltransferase in mammals comprising administering a peptide consisting essentially of an amino acid sequence subunit of *S. mutans* glucosyltransferase-B comprising an amino acid selected from the group consisting of aspartate 562, aspartate 567, histidine 561, tryptophan 491, glutamate 489, and combinations thereof, and which is of sufficient length to raise an immune response in the mammal, to the mammal, which thereby provokes said immune response.

- C 2
14. (Amended) A method of immunizing a mammal against dental caries comprising administering a peptide consisting essentially of an amino acid sequence subunit of *S. mutans* glucosyltransferase-B comprising an amino acid selected from the group consisting of aspartate 562, aspartate 567, histidine 561, tryptophan 491, glutamate 489, and combinations thereof, and which is of sufficient length to raise an immune response in the mammal, to the mammal.

Please add the following new claims.

- SVB  
DI
- C 3
20. ✓ (New) An immunogenic composition comprising at least one peptide which is an amino acid sequence subunit of *S. mutans* glucosyltransferase-B which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid selected from the group consisting of aspartate 562, aspartate 567, histidine 561, tryptophan 491, glutamate 489, and combinations thereof.

- SVB  
EI
21. ✓ (New) An immunogenic composition comprising at least one peptide which is an amino acid sequence subunit of *S. mutans* glucosyltransferase-B which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid sequence selected from the group consisting of:

- a) SEQ ID NO: 1; and  
b) SEQ ID NO: 2.

22. ✓ (New) An immunogenic composition comprising at least one peptide consisting essentially of SEQ ID NO: 3.
23. (New) An immunogenic composition according to Claim 20 wherein 2 or more of the peptides are present and arranged on a core matrix of 3 or more lysines.
24. ✓ (New) An immunogenic composition comprising at least two peptides covalently attached to a peptidyl core matrix, wherein each peptide is an amino acid sequence subunit of *S. mutans* glucosyltransferase-B which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid selected from the group consisting of aspartate 562, aspartate 567, histidine 561, tryptophan 491, glutamate 489, and combinations thereof.
25. ✓ (New) An immunogenic composition comprising at least two peptides covalently attached to a peptidyl core matrix, wherein each peptide is an amino acid sequence subunit of *S. mutans* glucosyltransferase-B which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid sequence selected from the group consisting of:
- a) SEQ ID NO: 1; and
  - b) SEQ ID NO: 2.
26. (New) An immunogenic composition according to Claim 24 further comprising at least one additional immunologic component covalently attached to said peptidyl core matrix.
27. (New) An immunogenic composition according to Claim 26 wherein the additional immunologic component is an immunogenic portion of a pathogen selected from the group consisting of diphtheria, pertussis, tetanus, measles and poliovirus.
28. (New) An immunogenic composition according to Claim 24 wherein the peptidyl core matrix comprises at least one lysine.

29. (New) An immunogenic composition according to Claim 20 wherein the immune response is to glucosyltransferase and results in the reduction of the colonization or accumulation of mutans streptococcal strains in a mammal to whom the vaccine composition is administered
30. (New) An immunogenic composition according to Claim 24 wherein the immune response is to glucosyltransferase and results in the reduction of the colonization or accumulation of mutans streptococcal strains in a mammal to whom the vaccine composition is administered.
31. ✓ (New) An immunogenic composition comprising at least one peptide which is an amino acid sequence subunit of *S. mutans* glucosyltransferase-C which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid selected from the group consisting of aspartate 586, aspartate 591, histidine 585, tryptophan 517, glutamate 515, and combinations thereof.
32. ✓ (New) An immunogenic composition comprising at least one peptide which is an amino acid sequence subunit of *S. mutans* glucosyltransferase-C which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid sequence selected from the group consisting of:
- a) SEQ ID NO: 10; and
  - b) SEQ ID NO: 15.
33. (New) An immunogenic composition according to Claim 31 wherein 2 or more of the peptides are present and arranged on a core matrix of 3 or more lysines.
34. ✓ (New) An immunogenic composition comprising at least two peptides covalently attached to a peptidyl core matrix, wherein each peptide is an amino acid sequence subunit of *S. mutans* glucosyltransferase-C which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid

selected from the group consisting of aspartate 586, aspartate 591, histidine 585, tryptophan 517, glutamate 515 and combinations thereof.

35. (New) An immunogenic composition comprising at least two peptides covalently attached to a peptidyl core matrix, wherein each peptide is an amino acid sequence subunit of *S. mutans* glucosyltransferase-C which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid sequence selected from the group consisting of:
  - a) SEQ ID NO: 10; and
  - b) SEQ ID NO: 15.
36. (New) An immunogenic composition according to Claim 34 further comprising at least one additional immunologic component covalently attached to said peptidyl core matrix.
37. (New) An immunogenic composition according to Claim 36 wherein the additional immunologic component is an immunogenic portion of a pathogen selected from the group consisting of diphtheria, pertussis, tetanus, measles and poliovirus.
38. (New) An immunogenic composition according to Claim 34 wherein the peptidyl core matrix comprises at least one lysine.
39. (New) An immunogenic composition according to Claim 31 wherein the immune response is to glucosyltransferase and results in the reduction of the colonization or accumulation of mutans streptococcal strains in a mammal to whom the vaccine composition is administered.
40. (New) An immunogenic composition according to Claim 34 wherein the immune response is to glucosyltransferase and results in the reduction of the colonization or accumulation of mutans streptococcal strains in a mammal to whom the vaccine composition is administered.

- sub 5b
41. ✓ (New) An immunogenic composition comprising at least one peptide which is an amino acid sequence subunit of *S. mutans* glucosyltransferase-D which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid selected from the group consisting of tyrosine 587, aspartate 582, histidine 581, tryptophan 505, glutamate 503 and combinations thereof.
42. ✓ (New) An immunogenic composition comprising at least one peptide which is an amino acid sequence subunit of *S. mutans* glucosyltransferase-D which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid sequence selected from the group consisting of:
- a) SEQ ID NO: 11; and
  - b) SEQ ID NO: 16.
43. (New) An immunogenic composition according to Claim 41 wherein 2 or more of the peptides are present and arranged on a core matrix of 3 or more lysines.
- sub 6 D 7
44. ✓ (New) An immunogenic composition comprising at least two peptides covalently attached to a peptidyl core matrix, wherein each peptide is an amino acid sequence subunit of *S. mutans* glucosyltransferase-D which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid selected from the group consisting of tyrosine 587, aspartate 582, histidine 581, tryptophan 505, glutamate 503 and combinations thereof.
45. ✓ (New) An immunogenic composition comprising at least two peptides covalently attached to a peptidyl core matrix, wherein each peptide is an amino acid sequence subunit of *S. mutans* glucosyltransferase-D which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid sequence selected from the group consisting of:
- a) SEQ ID NO: 11; and
  - b) SEQ ID NO: 16.

46. (New) An immunogenic composition according to Claim 44 further comprising at least one additional immunologic component covalently attached to said peptidyl core matrix.
47. (New) An immunogenic composition according to Claim 46 wherein the additional immunologic component is an immunogenic portion of a pathogen selected from the group consisting of diphtheria, pertussis, tetanus, measles and poliovirus.
48. (New) An immunogenic composition according to Claim 44 wherein the peptidyl core matrix comprises at least one lysine.
49. (New) An immunogenic composition according to Claim 41 wherein the immune response is to glucosyltransferase and results in the reduction of the colonization or accumulation of mutans streptococcal strains in a mammal to whom the vaccine composition is administered.
50. (New) An immunogenic composition according to Claim 44 wherein the immune response is to glucosyltransferase and results in the reduction of the colonization or accumulation of mutans streptococcal strains in a mammal to whom the vaccine composition is administered.
51. ✓ (New) An immunogenic composition comprising at least one peptide which is an amino acid sequence subunit of *S. downei* glucosyltransferase-S which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid selected from the group consisting of tyrosine 550, aspartate 545, histidine 544, tryptophan 478, glutamate 476 and combinations thereof.
52. ✓ (New) An immunogenic composition comprising at least one peptide which is an amino acid sequence subunit of *S. downei* glucosyltransferase-S which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid sequence selected from the group consisting of:

- a) SEQ ID NO: 13; and  
b) SEQ ID NO: 18.
53. (New) An immunogenic composition according to Claim 51 wherein 2 or more of the peptides are present and arranged on a core matrix of 3 or more lysines.
54. ✓ (New) An immunogenic composition comprising at least two peptides covalently attached to a peptidyl core matrix, wherein each peptide is an amino acid sequence subunit of *S. downei* glucosyltransferase-S which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid selected from the group consisting of tyrosine 550, aspartate 545, histidine 544, tryptophan 478, glutamate 476, and combinations thereof.
55. ✓ (New) An immunogenic composition comprising at least two peptides covalently attached to a peptidyl core matrix, wherein each peptide is an amino acid sequence subunit of *S. downei* glucosyltransferase-S which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid sequence selected from the group consisting of:  
a) SEQ ID NO: 13; and  
b) SEQ ID NO: 18.
56. (New) An immunogenic composition according to Claim 54 further comprising at least one additional immunologic component covalently attached to said peptidyl core matrix.
57. (New) An immunogenic composition according to Claim 56 wherein the additional immunologic component is an immunogenic portion of a pathogen selected from the group consisting of diphtheria, pertussis, tetanus, measles and poliovirus.
58. (New) An immunogenic composition according to Claim 54 wherein the peptidyl core matrix comprises at least one lysine.

59. (New) An immunogenic composition according to Claim 51 wherein the immune response is to glucosyltransferase and results in the reduction of the colonization or accumulation of *S. downei* streptococcal strains in a mammal to whom the vaccine composition is administered.
60. (New) An immunogenic composition according to Claim 54 wherein the immune response is to glucosyltransferase and results in the reduction of the colonization or accumulation of *S. downei* streptococcal strains in a mammal to whom the vaccine composition is administered.
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7 61. (New) An immunogenic composition comprising at least one peptide which is an amino acid sequence subunit of *S. downei* glucosyltransferase-I which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid selected from the group consisting of aspartate 562, aspartate 567, histidine 561, tryptophan 493, glutamate 491 and combinations thereof.
62. (New) An immunogenic composition comprising at least one peptide which is an amino acid sequence subunit of *S. downei* glucosyltransferase-I which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid sequence selected from the group consisting of:
- a) SEQ ID NO: 12; and
  - b) SEQ ID NO: 17.
63. (New) An immunogenic composition according to Claim 61 wherein 2 or more of the peptides are present and arranged on a core matrix of 3 or more lysines.
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7 64. (New) An immunogenic composition comprising at least two peptides covalently attached to a peptidyl core matrix, wherein each peptide is an amino acid sequence subunit of *S. downei* glucosyltransferase-I which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid



selected from the group consisting of aspartate 562, aspartate 567, histidine 561, tryptophan 493, glutamate 491, and combinations thereof.

65. (New) An immunogenic composition comprising at least two peptides covalently attached to a peptidyl core matrix, wherein each peptide is an amino acid sequence subunit of *S. downei* glucosyltransferase-I which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid sequence selected from the group consisting of:
- a) SEQ ID NO: 12; and
  - b) SEQ ID NO: 17.
66. (New) An immunogenic composition according to Claim 64 further comprising at least one additional immunologic component covalently attached to said peptidyl core matrix.
67. (New) An immunogenic composition according to Claim 66 wherein the additional immunologic component is an immunogenic portion of a pathogen selected from the group consisting of diphtheria, pertussis, tetanus, measles and polio virus.
68. (New) An immunogenic composition according to Claim 64 wherein the peptidyl core matrix comprises at least one lysine.
69. (New) An immunogenic composition according to Claim 61 wherein the immune response is to glucosyltransferase and results in the reduction of the colonization or accumulation of *S. downei* streptococcal strains in a mammal to whom the vaccine composition is administered.
70. (New) An immunogenic composition according to Claim 64 wherein the immune response is to glucosyltransferase and results in the reduction of the colonization or accumulation of *S. downei* streptococcal strains in a mammal to whom the vaccine composition is administered.

71. (New) An immunogenic composition comprising at least one peptide which is an amino acid sequence subunit of *S. sobrinus* glucosyltransferase-2 which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid selected from the group consisting of aspartate 561, aspartate 556, histidine 555, tryptophan 487, glutamate 485 and combinations thereof.
72. (New) An immunogenic composition comprising at least one peptide which is an amino acid sequence subunit of *S. sobrinus* glucosyltransferase-2 which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid sequence selected from the group consisting of:
- a) SEQ ID NO: 14; and
  - b) SEQ ID NO: 19.
73. (New) An immunogenic composition according to Claim 71 wherein 2 or more of the peptides are present and arranged on a core matrix of 3 or more lysines.
74. (New) An immunogenic composition comprising at least two peptides covalently attached to a peptidyl core matrix, wherein each peptide is an amino acid sequence subunit of *S. sobrinus* glucosyltransferase-2 which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid selected from the group consisting of aspartate 561, aspartate 556, histidine 555, tryptophan 487, glutamate 485, and combinations thereof.
75. (New) An immunogenic composition comprising at least two peptides covalently attached to a peptidyl core matrix, wherein each peptide is an amino acid sequence subunit of *S. sobrinus* glucosyltransferase-2 which is of sufficient length to raise an immune response in a mammal to whom it is administered comprising an amino acid sequence selected from the group consisting of:
- a) SEQ ID NO: 14; and
  - b) SEQ ID NO: 19.